**Article Full Title**

The effects of ankle mobilization and active stretching on the difference of weight-bearing distribution, low back pain and flexibility in pronated-foots subjects

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**Paper Abstract**

The purpose of this study was designed to analyze the effects mobilization and active stretching on the difference of weight-bearing distribution, low back pain, and flexibility in pronated-foot subjects. The subjects of this study were 16 chronic low back pain patients. They were randomly divided into the control and experimental group. The experimental group had used the model of ankle mobilization and calf muscle active stretching three times per week, for 4 weeks. The control group did same method without an ankle mobilization. The range of flexion and extension motion of the lumbar vertebrae and low back pain degree and difference of weight-bearing were measured before and after the experiment. The model of ankle mobilization and calf muscle stretching of pronated-foot significantly improved the range of flexion and extension motion of the vertebrae. And the visual analogue scale and distribution of weight-bearing were decreased in both of two groups. In other word, the exercise of this study showed that the model of ankle mobilization and calf muscle stretching of pronated-foot had positive effects on improving the range of flexion and extension motion of the vertebrae. The calf muscle stretching was easy and it is effective in therapy that patients by themselves and helped to recover the balance of the vertebrae to combine ankle mobilization and muscle stretching.

**NIH Risk of Bias Tool**

Quality Assessment of Controlled Intervention Studies

**Was the study described as randomized, a randomized trial, a randomized clinical trial, or an RCT**

Cannot Determine, Not Reported, or Not Applicable

**Was the method of randomization adequate (i.e., use of randomly generated assignment)?**

Cannot Determine, Not Reported, or Not Applicable

**Was the treatment allocation concealed (so that assignments could not be predicted)?**

Cannot Determine, Not Reported, or Not Applicable

**Were study participants and providers blinded to treatment group assignment?**

Cannot Determine, Not Reported, or Not Applicable

**Were the people assessing the outcomes blinded to the participants' group assignments?**

Cannot Determine, Not Reported, or Not Applicable

**Were the groups similar at baseline on important characteristics that could affect outcomes (e.g., demographics, risk factors, co-morbid conditions)?**

No

**Was the overall drop-out rate from the study at endpoint 20% or lower of the number allocated to treatment?**

Yes

**Was the differential drop-out rate (between treatment groups) at endpoint 15 percentage points or lower?**

Yes

**Was there high adherence to the intervention protocols for each treatment group?**

Yes

**Were other interventions avoided or similar in the groups (e.g., similar background treatments)?**

Cannot Determine, Not Reported, or Not Applicable

**Were outcomes assessed using valid and reliable measures, implemented consistently across all study participants?**

Yes

**Did the authors report that the sample size was sufficiently large to be able to detect a difference in the main outcome between groups with at least 80% power?**

Cannot Determine, Not Reported, or Not Applicable

**Were outcomes reported or subgroups analyzed prespecified (i.e., identified before analyses were conducted)?**

Yes

**Were all randomized participants analyzed in the group to which they were originally assigned, i.e., did they use an intention-to-treat analysis?**

Yes

**Key Finding #1**

The ASG (active stretching group) and ASG + MOG (mobilization) both showed statistical significance between pre- and post- interventions across all 3 categories: trunk flexion/extension test (flexibility), visual analogue scale, and weight bearing distribution.

**Key Finding #2**

There was no statistical significance between the ASG and ASG+MOG in terms of lumbar region flexion, but there was statistical significance in terms of pain and weight bearing differences with it being more effective in the ASG + MOG group.

**Key Finding #3**

The control group (no treatment) showed no statistical significance across all three variables.

**Key Finding #4**

**Please provide your summary of the paper**

This study shows that active calf stretching combined with ankle mobilization has more significant effects on weight bearing distribution, low back pain, and trunk flexibility in subjects with pronated feet. The ASG also showed positive effects on all three variables, but to a lesser extent. While the non-treatment group showed no significant effects on any three of the variables. This study helps show the importance of evaluating the musculoskeletal system for potential spinal imbalances, which interfere with walking and support, and working to fix them. Joints are mutually connected so when one area is off it leads to compensations down the chain which creates imbalances. When working with subjects that have chronic LBP and pronated feet, combining active calf stretching with ankle mobilizations would yield the most benefit. Active stretching alone is also more beneficial than no treatment.

**Please provide your clinical interpretation of this paper. Include how this study may impact clinical practice and how the results can be implemented.**

When working with subjects that are dealing with chronic low back pain and pronated feet, active stretching with ankle mobilization may be the most beneficial in improving pain intensity, flexibility, and weight bearing distribution. However, this study has several limitations so further research is needed to validate these results. Implementation of the study's results should not be the first line of choice for intervention.